

## CLAIMS

1           1.       A follower apparatus for use in guiding material between the follower and a spool,  
2 the follower comprising:

3                   (a)     a follower module including

4                            i)     a base;

5                            ii)    a roller rotatably attached to said base for guiding said material;

6                            iii)   detection apparatus for detecting when said material is not in a  
7                                    selected zone of said roller and for outputting a corresponding  
8                                    indicative signal;

9                   (b)     motorized apparatus for moving said follower module; and

10                   (c)    control apparatus responsive to said signal for directing said motorized  
11                            apparatus to move said module into said selected zone.

1           2.       An apparatus as recited in claim 1 wherein said module further includes a pulley  
2 for receiving and redirecting said material from said roller.

1           3.       An apparatus as recited in claim 2 wherein an axis of rotation of said pulley is  
2 oriented parallel to an axis of rotation of said roller.

1           4.       An apparatus as recited in claim 2 wherein an axis of rotation of said pulley is  
2 oriented orthogonal to an axis of rotation of said roller.

1           5.       An apparatus as recited in claim 1 wherein said detection apparatus includes a  
2 light emitter and detector apparatus.

1           6.       An apparatus as recited in claim 5 wherein said light emitter and detector  
2 apparatus includes at least one first emitter and first detector for detecting said material in a first  
3 side zone on one side of said selected zone and at least one second emitter and second detector  
4 for detecting said material in a second side zone on an opposite side of said selected zone.

1           7.       An apparatus as recited in claim 6 wherein each said detector is positioned to  
2 detect light reflected from said material.

1           8.       An apparatus as recited in claim 6 wherein each said detector is positioned to  
2 detect a reduction in light from a corresponding said emitter caused by said material entering a  
3 space between said emitter and said detector.

1           9.       An apparatus as recited in claim 3 wherein said detection apparatus includes a  
2 light emitter and detector apparatus.

1           10.      An apparatus as recited in claim 9 wherein said light emitter and detector  
2 apparatus includes at least one first emitter and first detector for detecting said material in a first  
3 side zone on one side of said selected zone and at least one second emitter and second detector  
4 for detecting said material in a second side zone on an opposite side of said selected zone.

1           11.      An apparatus as recited in claim 10 wherein said first and second emitter and first  
2 and second detector are positioned at an oblique angle to a plane defined by a direction of travel  
3 of material between said roller and said pulley and a line passing through said material and lying  
4 parallel to an axis of rotation of said roller.

1           12.      An apparatus as recited in claim 11 wherein said first and second emitter are  
2 positioned so as to direct a light beam at right angles to a direction of travel of said material.

1           13.      An apparatus as recited in claim 3 wherein walls of said pulley are tapered so as to  
2 avoid interference with said material.

1           14.      An apparatus as recited in claim 2 wherein said pulley is rotatably mounted on a  
2 support apparatus, and said support apparatus is rotatably mounted on a support axis lying in a  
3 plane of the pulley and orthogonal to a direction of material passage from said roller to said  
4 pulley, allowing said plane of said pulley to rotate about said support axis so as to maintain said  
5 material substantially in said plane of said pulley as a direction of travel of said material changes.

1           15.      An apparatus as recited in claim 14 wherein said detection apparatus includes an  
2 encoder apparatus for detecting a value of an angle of rotation of said plane about said support  
3 axis, wherein said value of said angle provides an indication of when said material is not in said  
4 selected zone.

1           16.     An apparatus as recited in claim 1 wherein said follower module includes first and  
2 second physical stops positioned approximate first and second ends of said roller so as to prevent  
3 said material from moving past said ends of said roller.

1           17.     An apparatus for guiding material between a spool and a material guidance  
2 module comprising:

- 3                   (a)     a spool module for rotatably mounting a spool;
- 4                   (b)     a material guide module including
  - 5                       i)     a base;
  - 6                       ii)    a roller rotatably attached to said base for guiding said material;
  - 7                       iii)   detection apparatus for detecting when said material is not in a
  - 8                               selected zone of said roller and outputting a corresponding
  - 9                               indicative signal;
- 10                  (c)     motorized apparatus for moving said spool module; and
- 11                  (d)     control apparatus responsive to said signal for moving said motorized
- 12                       apparatus so as to move said spool module to position said material into
- 13                       said selected zone.

1           18.     An apparatus as recited in claim 17 wherein said material guide module further  
2 includes a pulley for receiving and directing said material from said roller.

1           19.     An apparatus as recited in claim 18 wherein an axis of rotation of said pulley is  
2 oriented parallel to an axis of rotation of said roller.

1           20.     An apparatus as recited in claim 18 wherein an axis of rotation of said pulley is  
2 oriented orthogonal to an axis of rotation of said roller.

1           21.     An apparatus as recited in claim 17 wherein said detection apparatus includes a  
2 light emitter and detector apparatus.

1           22.     An apparatus as recited in claim 21 wherein said light emitter and detector  
2 apparatus includes at least one first emitter and first detector for detecting said material in a first  
3 side zone on one side of said selected zone and at least one second emitter and second detector  
4 for detecting said material in a second side zone on a opposite side of said selected zone.

1           23.     An apparatus as recited in claim 1 wherein said motorized apparatus includes a  
2 track, and wherein said base is configured to move on said track, and wherein said track is  
3 oriented substantially parallel to an axis of rotation of said spool.

1           24.     An apparatus as recited in claim 17 wherein said motorized apparatus includes a  
2 track and said spool module is configured to move on said track, and wherein said track is  
3 oriented substantially parallel to an axis of rotation of said roller.